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ABSTRACT

This study was designed to identify the age at which children who are between 1 and 8 years old display the least anxiety during their first dental visit. Parents completed a survey that asked for the child's gender, age at first dental visit, and general reaction to the first visit. Children's reactions were classified as resistant, anxious, comfortable, and enjoyable. Results indicated that children who were between 2.5 and 3.5 years of age exhibited less anxiety than children at other ages. A total of 66.6 percent of the children who felt comfortable at the first dental visit, and 79 percent of those who enjoyed the first visit, were between 2.5 and 4 years of age. A total of 85 percent of the children who were anxious at their first dental visit were 5 years old or older. A sample survey for parents is appended. (BC)

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Children's Response to First Dental Visit As A Function of Age

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Abstract

The present study attempted to identify the age at which children display the least amount of anxiety during first dental visit. A survey which asked for the child's present age, gender, age at first dental visit, and a general evaluation of the child's reaction to the visit, was distributed to two day care institutions in Eastern Pennsylvania. At first dental visit, it was found that 66.6% of those children who felt comfortable and 79% of those who seemed to enjoy the experience were between the ages of 2 1/2 and 4. In addition, 85% of those children who seemed somewhat anxious were ages 5 and older.

Research investigating dental fear and anxiety has increased dramatically in recent years. It has been estimated that at least 15% of the population avoids much needed dental treatment every year because of psychological concerns (Smudski, 1986). These concerns may be associated with negative dental experiences during childhood. The fearful reaction during children's dental visits is a problem for practicing dentists as well as a source of great anxiety for their young patients. Many studies have attempted to identify the causes of dental anxiety while others have focused on the effectiveness of coping strategies and treatment of such phobias. In an observational study on the development of children's dental fears, age trends and specificity of response in children's dental fears were investigated (Rape, 1988). The subjects consisted of 50 black 3 to 11-year-olds from families of low socioeconomic status. During routine dental procedures at a community clinic, heart rates, self-reported fear, and observed behavior were measured at each of nine phases of treatment. These phases of treatment were classified as highly invasive, intermediately invasive, or noninvasive. The results indicated a higher level of fear during the highly invasive procedures as compared to the intermediately invasive procedures, and a higher level of fear during the intermediately invasive than during those which were categorized as noninvasive. In addition, age differences in fear were most pronounced during the intermediately invasive phases. These results imply that there exists a correlation between the degree of invasiveness of a particular procedure and the amount of

anxiety experienced during that procedure.

In contradiction with this study were the findings of a second study in which the dental records of a group of children were examined over a period of three years to determine whether the quantity and quality of their dental experience would be related to increases of dental anxiety. The subjects were children of both sexes between the ages of 9 and 12. These children were divided into two groups based upon their patterns of attendance and whether or not they had received invasive treatment during these visits. It was found that children who did not receive invasive treatment were significantly more anxious than those who had (Murray, 1989). However, the dental anxiety of children who attended regularly and received invasive treatment did not change. Therefore, the effect of invasive versus noninvasive treatment seems to depend on the attendance of the subject.

In an attempt to resolve the conflicting evidence concerning whether dental anxiety is a specific fear or a case of general fearfulness, Andree Liddell conducted a study using the mothers of 12-year-old children. The mothers were interviewed about their child's temperament and early dental and medical experiences. Researchers found that early signs of distress in the operatory were predictive of later dental anxiety. It was also found that dental anxiety was more closely related to previous negative dental experiences than was general fearfulness. Additionally, females who were found to be dentally anxious appeared to be influenced by internal factors while

dentally anxious males were influenced by external ones.

In a study conducted in 1990 by Arntz and Van Eck, the expectations and experiences of pain and of anxiety of 40 subjects who had undergone extensive dental treatment on two occasions were investigated. It was found that extremely anxious subjects expected more pain and anxiety than they actually experienced. It appeared that these subjects needed more experiences to bring their expectations closer to reality. After a period without frequent dental visits, however, these expectations seem to return back to the original level of inaccuracy. As compared with the fearless subjects, those with anxiety did not experience more pain, but simply more anxiety. Although the source of anxiety for these subjects is not defined in this study, the evidence does suggest that those with anxiety are not experiencing more pain. Thus, the fear of any expected evil may indeed be worse than the evil itself.

There has been little research into the anxiety experienced by the dentist during their administration of treatment and how this anxiety may affect the anxiety experienced by his/her patient. R. Freeman conducted a study which examined affective communication between dental students and their patients. Continuous and simultaneous cardiovascular monitoring during an entire dental treatment session was utilized. The results revealed that anxiety was communicated between dental operator and the patient. It was found, however, that this communication of anxiety was dependent on a third variable. This variable was the degree of clinical experience of the dental student.

Although it has been found to be effective in the reduction of anxiety, there had been no previous reports of the use of humor in the dental setting until Nevo and Shapira investigated the use of humor by pediatric dentists. In their study, these researchers interviewed and observed a sample of pediatric dentists, focusing on their use of humor. It was found that these dentists attempt to create a humorous and playful environment for their patients by using both verbal and nonverbal cues. The functions of humor that the dentists referred to during their interviews included diversion of attention, reducing the anxiety of the mother, dentist and child, creating and maintaining rapport, transmission of information through enjoyable means, and increasing interest and involvement of the child. More specifically, most of these dentists used terminology that was familiar and fun to their patients such as equating the dental chair with an airplane, the suction with a vacuum cleaner, and the high speed drill with a fireman's hose. Although comparative studies were not conducted to observe the actual reduction or perhaps augmentation of dental anxiety in these children, the researchers stated that they were extremely convinced that humor can provide a very effective tool in helping to minimize and control anxiety associated with dental treatment.

In addition to the use of humor, another form of distraction which has been utilized in the dental setting is the use of music. One study used 80 out-patients of a dental clinic to examine the effects of auditory distraction (Wostratzky, 1988). The subjects were divided into four groups, each consisting of

twenty subjects. The first group received usual treatment. In the second group, a method of "passive distraction" was applied. A third group was "actively distracted" during treatment. Finally, the fourth group received all three of the methods, each on one of three separate days of treatment. In the "passive distraction" scenario, the subjects heard music through headphones, and the loudness and type of music was thus under the control of the subjects themselves. The "active distraction" situation was identical to the aforementioned with the one exception that the subjects had to depress a button in order to hear the music. Through subjective ratings, it was found that nearly all subjects who were subjected to the use of music assessed their treatment to be less painful. The effect of the active distraction method were found to be the most beneficial. Heart rate monitors were utilized to assess if the increase in rate was not as high due to the more relaxed, less anxious patient. This hypothesized lessening of the increase in heart rate was not found to be significant, however, the fact that listening to music may also cause an increase in one's heart rate may be very well be a confounding variable.

Another study investigated the use and efficacy of distraction with 4 children undergoing dental treatment (Stark, 1989). Rather than music, the subjects were shown a poster and told a story about it during a dental procedure. The children earned a prize if they paid attention to the poster and could correctly answer questions concerning the story after each visit. It was found that anxious and disruptive behavior decreased upon

the introduction of intervention procedures for all children. However, 2 of the children demonstrated an increase in their anxious and disruptive behavior across intervention visits. Therefore, this form of distraction treatment may be useful for an initial change, but the change may not maintain itself.

In 1988, Pier J.M. Prins conducted a pre-posttest controlled group experiment to examine the efficacy of self-instructional training as a method to reduce children's dental fears. In the experiment, 30 dentally anxious 8 to 12-year-old children were assigned to one of three different experimental conditions or one of two control conditions. The experimental conditions consisted of training in threat-related verbal coping response, training in competence-related verbal coping responses, and an emotive-imagery procedure, while the control conditions used either a placebo or no treatment at all. The results indicated a significant reduction in anxiety across all groups. In addition, no difference was found between the groups. These results suggest that perhaps the potential efficacy of self-instructional training as a method to reduce serious fears in children should be re-evaluated.

In two related studies of the dental experience and behavior conducted by Liddell and Murray, it was found that dental anxiety increased with age. The subjects in this experiment were of both sexes and of ages 9 through 12. A significant effect was also found in that sex differences became marked after age 9 and girls contributed more to this increase than did the boys. Self-efficacy ratings regarding future good behavior in the dental

operatory were used to reflect emotional processing of past dental experiences. Low self-efficacy predictions and perception of dental anxiety in peers both seemed to contribute significantly to self-reports of dental anxiety.

Although the amount of research concerning both the sources and the treatments of dental anxiety has greatly increased in the recent past, there do not appear to be any studies which mention the age at first dental visit as a factor relating to this anxiety. The present study attempted to identify the specific ages, if any, at which children experience minimal degrees of anxiety. It was hypothesized that a child's first dental visit should take place no later than the age of 5 if it is to involve the least amount of anxiety.

Methods

Subjects

The subjects used in this experiment were 80 children ranging in age from 1 through 8. These children were presently attending one of two day care institutions in Eastern Pennsylvania.

Materials

A survey was created to assess each subject's present age, gender, age at first dental visit, and reaction to this first dental visit. Four choices were given concerning the child's reaction to the first visit; child resisted and/or cried, child seemed somewhat anxious, child seemed comfortable, and child enjoyed experience.

Procedure

The surveys were distributed at two day care institution in Eastern Pennsylvania to mothers (or fathers) upon pick up of their child. The data on the surveys was compiled and analyzed. Of the 84 surveys completed, 4 were not used because of incorrect completion.

Results

Based on the subjects' ages at first dental visit, four groups were created. The first group consisted of the children who first attended the dentist between the ages of 1 and 2. The second and third groups included subjects of ages 2 1/2 through 3 1/2 and ages 4 through 5, respectively. The final group consisted of children between the ages of 5 1/2 through 8. Groups I, III, and IV were all compared with the second group and t-tests were calculated for each comparison. These comparisons revealed a significant difference in all three cases.

The subjects who first attended the dentist between the ages of 2 1/2 and 3 1/2,

($x = 3.63$ $sd = .55$ $n = 32$)

experienced less anxiety and thus greater enjoyment than those in group I, who attended between ages 1 and 2,

($x = 2.8$ $sd = 1.55$ $n = 10$ $p < .02$, $t = 2.60$)

than those in group III, who attended between ages 4 and 5,

($x = 2.52$ $sd = .87$ $n = 25$ $p < .01$, $t = 5.84$)

and, most significantly, than those in group IV, who attended between the ages of 5 1/2 and 8.

($x = 2.0$ $sd = .82$ $n = 13$ $p < .01$, $t = 7.79$)

Discussion

It had been hypothesized that a child's first dental visit should take place no later than at age 5 if it is to involve the least amount of anxiety. The resulting t-tests seem to support this hypothesis. A significant difference in the level of anxiety was found between children ages 2 1/2 through 3 1/2 and children ages 5 1/2 through 8. This difference may be due to the increased socialization the latter group of children have experienced, specifically the interaction with peers. A child older than the age of 5 seems much more likely to have been exposed to the negative stereotypes surrounding a visit to the dentist than a child who is younger than 3 1/2. Although not quite to the same extent, this effect also appears to manifest itself in children between the ages of 4 and 5 who displayed a significantly greater amount of anxiety than the subjects ages 2 1/2 to 3 1/2. It cannot be stated, however, that the older a child is at first dental visit, the more anxiety he/she is likely to experience. The subjects who attended the dentist for the first time between the ages of 1 and 2 experienced more anxiety than the group of 2 1/2 and 3 1/2 year-old subjects. Perhaps this is because these younger children are not as willing to trust individuals other than their parents and/or familiar caregivers than children older than age 2.

An approximately equal amount of males (43) and females (37) were used in this study. In addition, a nearly equal distribution of gender was found in each age division. This fact facilitated the comparison of the anxiety experienced by the males as opposed to the females. Although one study had found that the difference between males and females becomes pronounced as age increases, no such difference was found in the present study. Perhaps this was because the latter included children only as old as age 8, while the former used subjects up to the age of 13.

One problem with this study is the unequal number of subjects among the different age groups. Since the number of subjects in the groups were distributed in a bell-shaped fashion, most of the subjects were found in the second and third age groups and thus ranged in age from 2 1/2 through 5. Therefore the resulting comparison between these two groups should perhaps be considered to be of greater significance that those from the other comparisons.

Another problem may have stemmed from the survey itself which relies on the memory of the parent for the child's age at first dental visit and the child's reaction to the visit. Additionally, the survey limited the parent's description of this reaction to only 4 choices. Thus, parents were forced to choose even if none of the choices or more than one of the choices were applicable.

Finally, the study did not address the question of whether or not a child's first dental visit does in fact affect the

child's subsequent dental visits throughout childhood and leading into adulthood. Although the previously reviewed research seems to support the idea that previous, negative dental experiences increase the amount of fear and anxiety experienced during subsequent visits and can even lead to avoidance of these visits, a longitudinal study would need to be conducted in order to provide further support for these studies.

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Sample Survey

We would appreciate your taking a moment to complete this survey for a research project on pediatric dentistry conducted at Ursinus College.

For each of your children please answer the following questions:

child	age	gender	age at first dental visit	Based on your memory, how would you describe this first dental visit?
1)	___	___	___	a) child seemed upset, resisted, cried b) child seemed somewhat anxious c) child seemed comfortable d) child seemed to enjoy experience
2)	___	___	___	a) child seemed upset, resisted, cried b) child seemed somewhat anxious c) child seemed comfortable d) child seemed to enjoy experience
3)	___	___	___	a) child seemed upset, resisted, cried b) child seemed somewhat anxious c) child seemed comfortable d) child seemed to enjoy experience
4)	___	___	___	a) child seemed upset, resisted, cried b) child seemed somewhat anxious c) child seemed comfortable d) child seemed to enjoy experience